PENHROS GOLF CLUB, LLANRHYSTUD, CEREDIGION: GEOPHYSICAL SURVEY

Caer Penrhos hillfort (CD094) (© DAT AP92-013.25)

Prepared by Dyfed Archaeological Trust
For: Rowland Rees-Evans

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Client	Rowland Rees-Evans
Event Record No	121680
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Report Prepared By	Charlie Enright
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CONTENTS

FIGURES

PHOTOGRAPHS

TABLE

PENRHOS GOLF CLUB, LLANRHYSTUD, CEREDIGION: GEOPHYSICAL SURVEY

EXECUTIVE SUMMARY

DAT Archaeological Services were commissioned to undertake a geophysical survey of a proposed development site at Penrhos Golf Club, Llanrystud, Ceredigion (centred on NGR SN 5500 6938).

The purpose of the survey was to provide a better indication of the archaeological potential of the site and if required, enable targeting of any further archaeological mitigation requirements before or during the development.

No obvious features of clear archaeological origin were observed in the geophysical survey results and the results suggest that the proposed development is unlikely to impact on any buried archaeological remains.

CRYNODEB GWEITHREDOL

Comisiynwyd Gwasanaethau Archeolegol YAD i ymgymryd arolwg geoffisegol o safle datblygu arfaethedig yng Nghlwb Golff Penrhos, Llanrystud, Ceredigion (wedi'i ganoli ar NGR SN 5500 6938).

Pwrpas yr arolwg oedd rhoi gwell arwydd o botensial archeolegol y safle ac, os oes angen, galluogi targedu unrhyw anghenion lliniaru archeolegol pellach cyn neu yn ystod y datblygiad.

Ni welwyd unrhyw nodweddion amlwg o darddiad archeolegol clir yng nghanlyniadau'r arolwg geoffisegol ac mae'r canlyniadau'n awgrymu nad yw'r datblygiad arfaethedig yn debygol o effeithio ar unrhyw weddillion archeolegol claddedig.

PENRHOS GOLF CLUB, LLANRHYSTUD, CEREDIGION: GEOPHYSICAL SURVEY

SUMMARY

DAT Archaeological Services were commissioned by Penrhos Golf Club, Llanrhystud, Ceredigion (centred on NGR SN 5500 6938).to undertake a geophysical survey for a proposed development consisting of an extension to the existing site to accommodate 34 additional static caravans together with landscaping. The site is currently used for grazing.

In total, an area measuring 0.81ha was surveyed. Although the geophysical survey data was generally good, no anomalies indicating archaeological remains were detected. The results of the geophysical survey suggest that the proposed development is unlikely to impact any buried archaeological remains.

1. INTRODUCTION

1.1 Project Commission

1.1.1 DAT Archaeological Services were commissioned by Mr Rowland Rees-Evans of Penrhos Golf Club to undertake a geophysical survey of a proposed development site centred on NGR SN 5500 6938 (Figure 1).

1.1.2 The proposed development comprises an extension to the existing caravan site to accommodate the siting of 34 additional caravans together with associated landscaping. The site is currently laid to pasture with some scrub.

1.1.3 Full planning permission has been granted for the proposed development (Planning Application No. A190622). A condition regarding archaeology had been attached to the planning permission (Condition 8) stating:

"No development shall take place until a qualified and competent archaeologist has submitted a written scheme of investigation (WSI) for approval in writing by the local planning authority."

1.1.4 Following discussions with the archaeological advisor to the planning authority (Dyfed Archaeological Trust-Development Management) it was decided the required archaeological mitigation would comprise a geophysical survey.

1.1.5 The geophysical survey was undertaken using a fluxgate gradiometer which detects subtle variations in the earth's magnetic field, which can indicate the presence of buried features such as ditches, pits, walls or postholes, which are not visible on the ground surface. The purpose of the geophysical survey was to provide a better indication of the archaeological potential of the site through the identification of subsurface features which could be indicative of archaeology. This will allow for an informed decision on whether any further archaeological mitigation is required or not before or during the development programme.

1.2. Scope of the Project

1.2.1 The aim of the project was:

- To identify the presence/absence of any potential archaeological deposits through an initial gradiometer survey;
- To establish the character and extent of any potential archaeological remains within the site area that could be affected by the proposed works;
- To prepare a report and archive on the results of the geophysical survey.

1.3 Report Outline

1.3.1 This report provides a summary and discussion of the geophysical survey and its results and puts those results within their regional and national context.

1.4 Abbreviations

1.4.1 Sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Monument (SM). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.5 Illustrations

1.5.1 Printed map extracts are not necessarily produced to their original scale.

1.6 Timeline

1.6.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

Period	Approximate date	
Palaeolithic –	*c.*450,000 – 10,000 BC	**Prehistoric**
Mesolithic –	*c.* 10,000 – 4400 BC	
Neolithic –	*c.*4400 – 2300 BC	
Bronze Age –	*c.*2300 – 700 BC	
Iron Age –	*c.*700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – *c.* AD 410	**Historic**
Post-Roman / Early Medieval Period –	*c.* AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period[1] –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20th century onwards	

Table 1: Archaeological and Historical Timeline for Wales

[1] The post-medieval and industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust

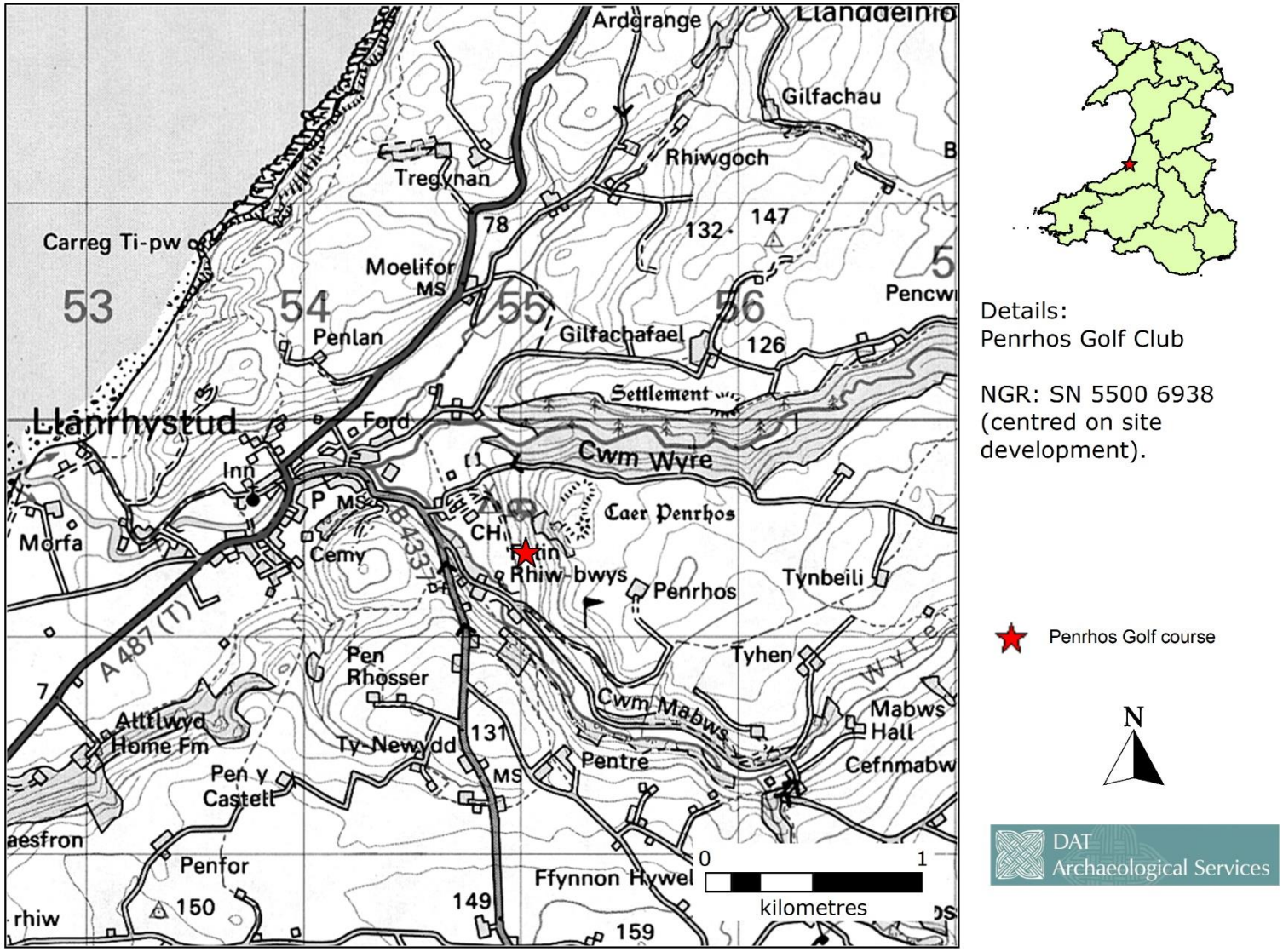

Figure 1: Site location

2. THE SITE

2.1 The proposed development site sits on a southwest-facing slope below Caer Penrhos Iron Age hillfort (PRN 1196), a scheduled monument (CD094) (Photo 1). Cadw describes the hillfort thus:

Caer Penrhos stands on a prominent local hilltop with wide views, particularly to the west and south. It is defended for the most part by a single bank standing up to 4m high externally and up to 2m above the interior, although on the north-west, the hillslope appears to be the only defence. Within this enclosure, at the south-east end, is a probable medieval ringwork measuring c.40m east-west by c.25m north-south, defined by a bank standing up to 1.5m internally and 3.5m externally, above a ditch up to 2m deep.

2.2 Recent research; including geophysical survey has shown that often extensive but hitherto unknown archaeological remains survive below ground, outside of hillforts. These remains have included evidence of settlement, additional defences and even burials.

2.3 The British Geological Survey records the underlying bedrock beneath the site Mynydd Bach Formation – Sandstone and Mudstone. A sedimentary rock formed almost 433 – 444 million years ago in areas previously dominated by deep seas (BGS online).

Photo 1: Aerial photograph of Caer Penrhos hillfort (CD094, PRN 1196) (© DAT AP89-H19)

3. METHODOLOGY

3.1 The geophysical survey was undertaken over 1 day on 11th February 2020. The proposed development site sits on a southwest-facing slope below Caer Penrhos Iron Age hillfort (Figure 2). The western side of the development area was not suitable for geophysical survey, being covered in scrub. However, enough of the development area could be surveyed to provide a good indication of any archaeological potential within this area.

3.2 A fluxgate gradiometer with a DL601 data logger was used to conduct the detailed geophysical survey, which detects variations in the earth's magnetic field. A sample interval of 0.25m (four readings per metre) was used with 1.0m wide traverses across 30m x 30m grids using the zigzag traverse method of collecting data. The gradiometers sensitivity was set to detect a magnetic variation in the order of 0.1 nanoTesla.

3.3 The survey grid was tied into the local Ordnance Survey grid using a Trimble Differential Global Position System (DGPS).

3.4 The data was processed using *Terrasurveyor 3.0.35.10* and is presented with a minimum of processing. The presence of high values caused by ferrous objects, which tend to hide fine details and obscure archaeological features, have been 'clipped' to remove the extreme values allowing the finer details to show through.

3.5 The processed data has been presented as a grey-scale plot, overlaid on local topographical features. The main magnetic anomalies have been identified and an interpretation of those results is also given where appropriate.

3.6 The resulting survey results and interpretation diagrams should not be seen as a definitive model of what lies beneath the ground surface, not all buried features will provide a magnetic response that can be identified by the gradiometer. In interpreting those features that are recorded the shape is the principal diagnostic tool, along with a comparison with known features from other surveys. The intensity of the magnetic response could provide further information, a strong response, for example, indicates burning, high ferric content or thermoremnancy in geology. The context may provide further clues but the interpretation of many of these features is still largely subjective.

3.7 All measurements given will be approximate as accurate measurements are difficult to determine from fluxgate gradiometer surveys. The width and length of the identified features can be affected by its relative depth and magnetic strength.

4. RESULTS

4.1 The geophysical survey results are presented as a greyscale plot in Figures 2 and 3. In total, an area of 0.81ha was surveyed.

4.2 No features of archaeological significance were observed in the geophysical survey data.

5. CONCLUSIONS

5.1 Generally the quality of the survey data was good; with little interference from external influences.

5.2 No obvious features of clear archaeological origin were observed in the geophysical survey results.

5.3 The results of this geophysical survey suggest that the proposed development is unlikely to impact on any buried archaeological deposits or features.

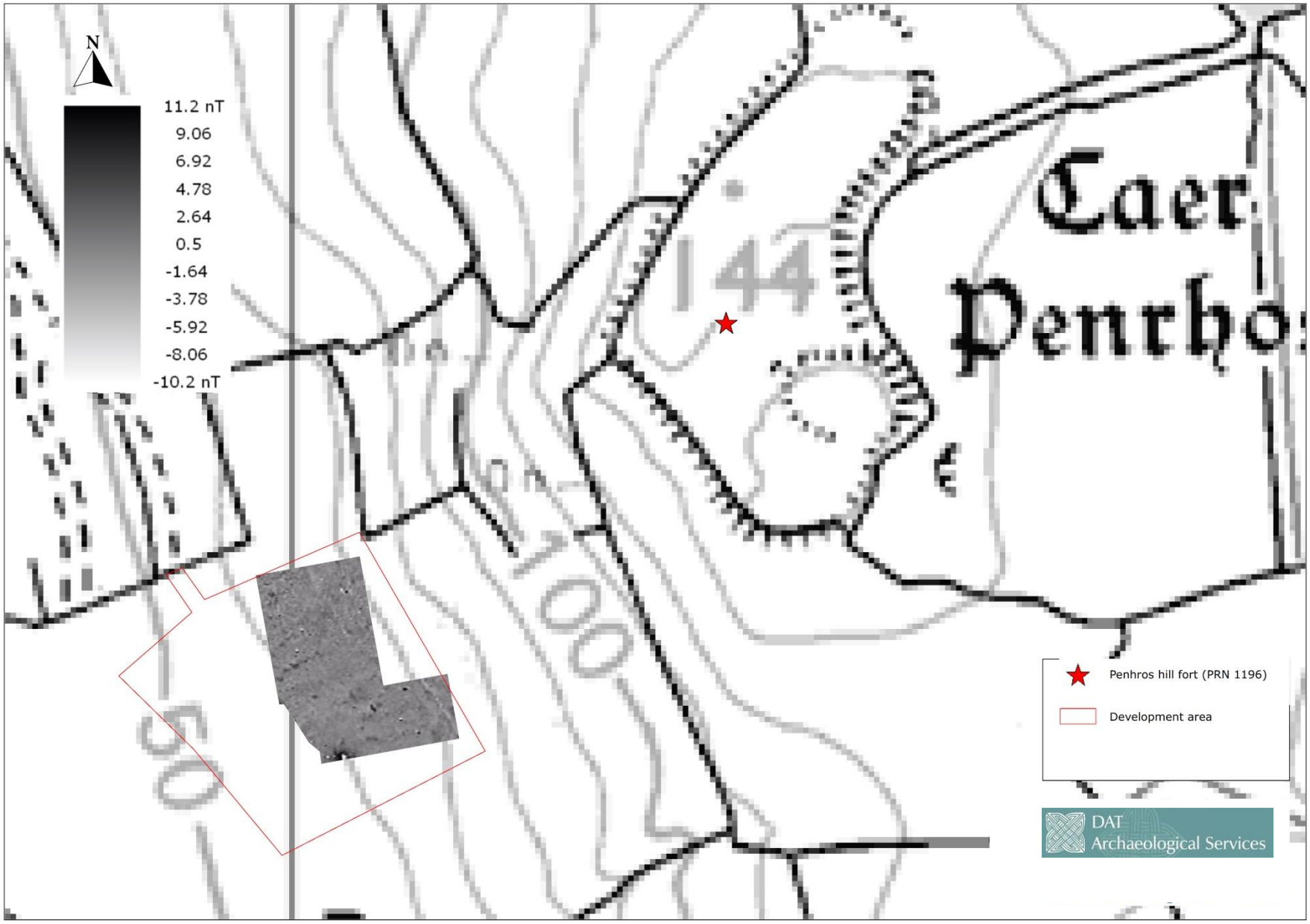

Figure 2: Location of development area; showing area subjected to geophysical survey.

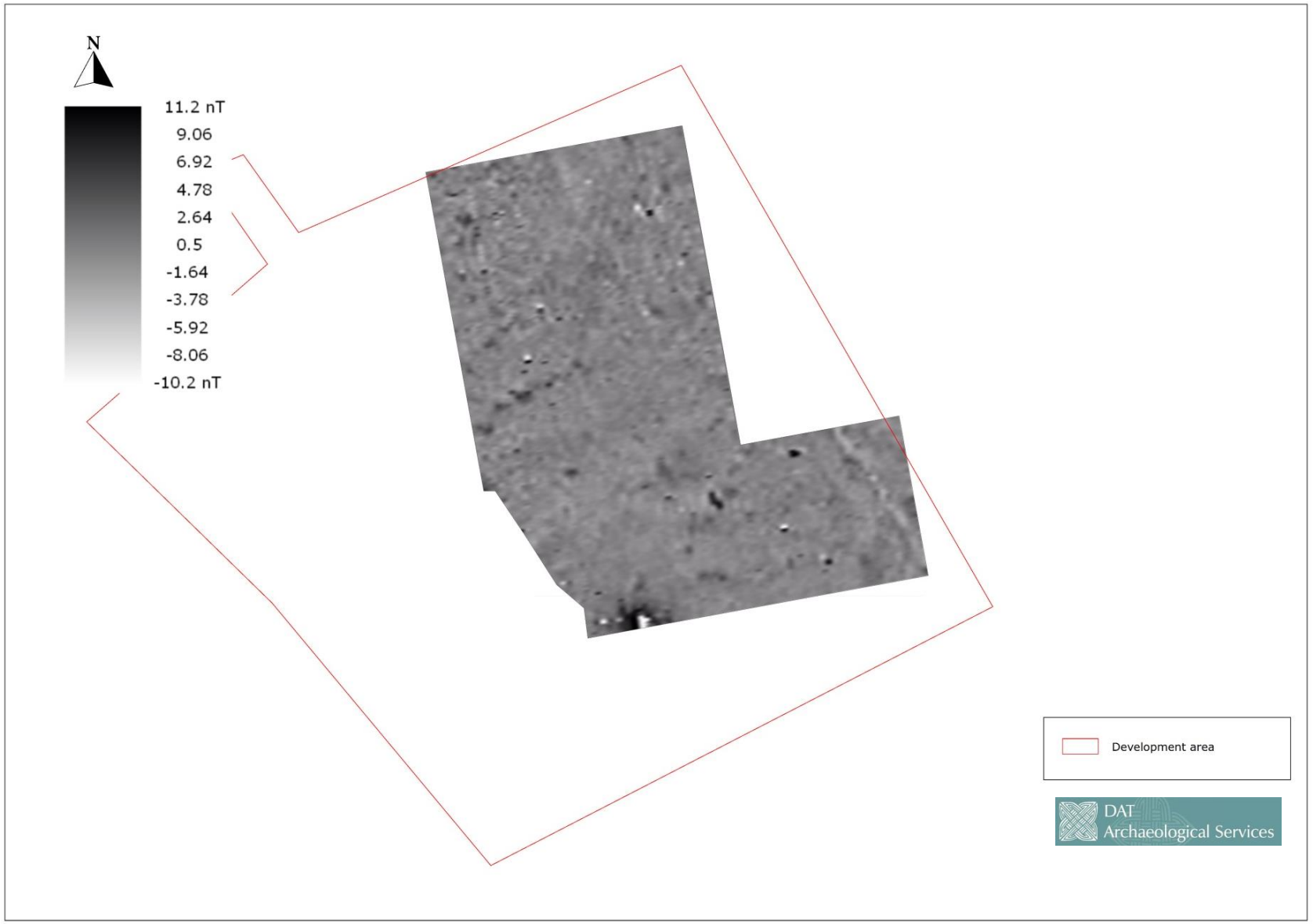

Figure 3: Geophysical survey results showing detailed greyscale plot.

6. SOURCES

Published

CIfA, 2014 *Chartered Institute of Field Archaeologists Standards and Guidance for Archaeological Geophysical Survey*

National Standard and Guidance for Collecting and Depositing Archaeological Archives in Wales 2017. http://www.welshmuseumsfederation.org/en/news-archive/resources-landing/Collections/national-standard-and-guidance-for-collecting-and-depositing-archaeological-archives-in-wales-2017.html

Online resources

British Geological Survey [online] Date Accessed 14th February, 2020.http://mapapps.bgs.ac.uk/geologyofbritain/home.html**.**

7. GLOSSARY

Fluxgate Gradiometer	An instrument used to measure magnetism to search for areas of disturbed ground that may be associated with subsurface archaeological features.
nanoTesla (nT)	A unit of measurement of a magnetic field.

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